

ABSTRACT OF THE DISCLOSURE

A maximum likelihood decoder includes metric generators for generating metrics based on a plurality of partial responses and a Viterbi decoder for realizing maximum likelihood decoding by using a synthetic metric generated by synthesizing the metrics. A first partial response is an original partial response. A second partial response is a differential response generated by subtraction by shifting the first partial response by 1 clock. Alternatively, the differential response may be generated by subtraction by shifting the first partial response by 2 clocks. The second partial response may be a response generated by addition by shifting the first partial response by 2 clocks. Alternatively, the second partial response may be an integration response generated by adding all previous samples of the first partial response.